No. 666,259. Patented Jan. 22, 1901.

W. S. BRYANT.

SELF ANNOUNCING BUOY.

(Application filed June 8, 1900.)

(No Model.) 2 Sheets—Sheet 1.

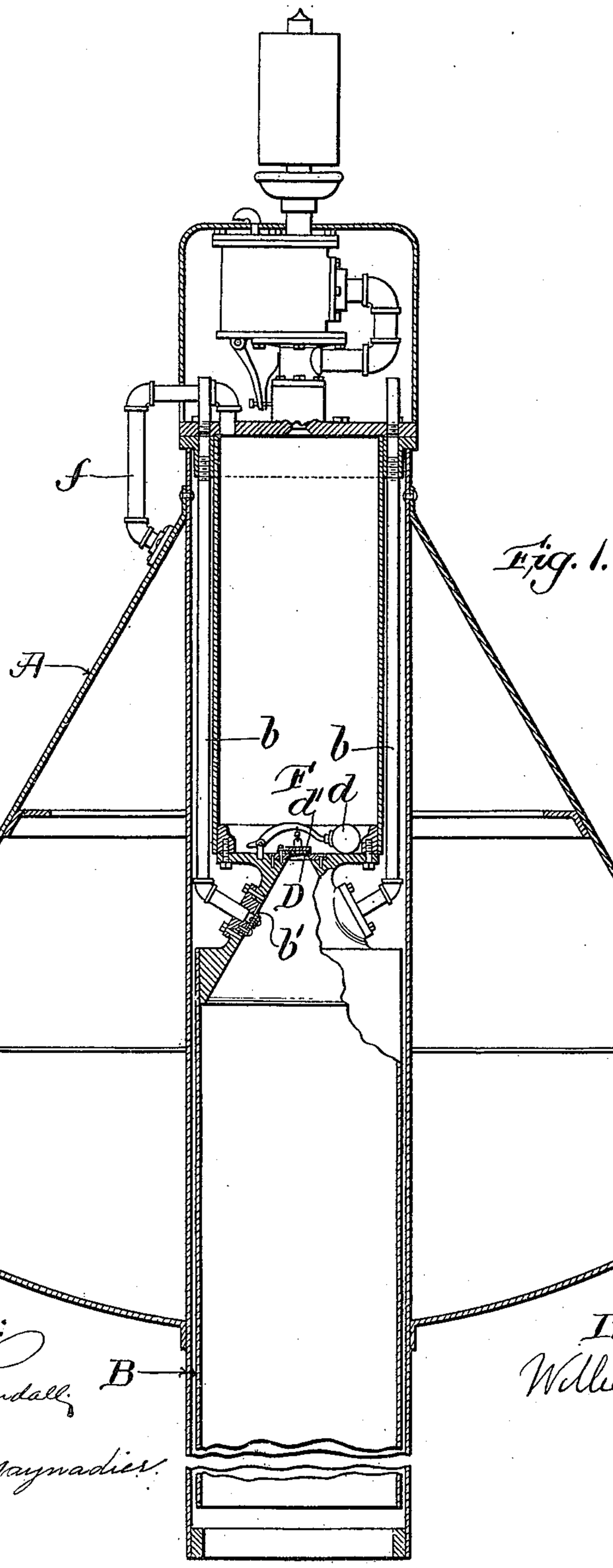

Fig. 1.

Witnesses:
Arthur D. Randall.
Carsten B. Maynadier.

Inventor:
William S. Bryant

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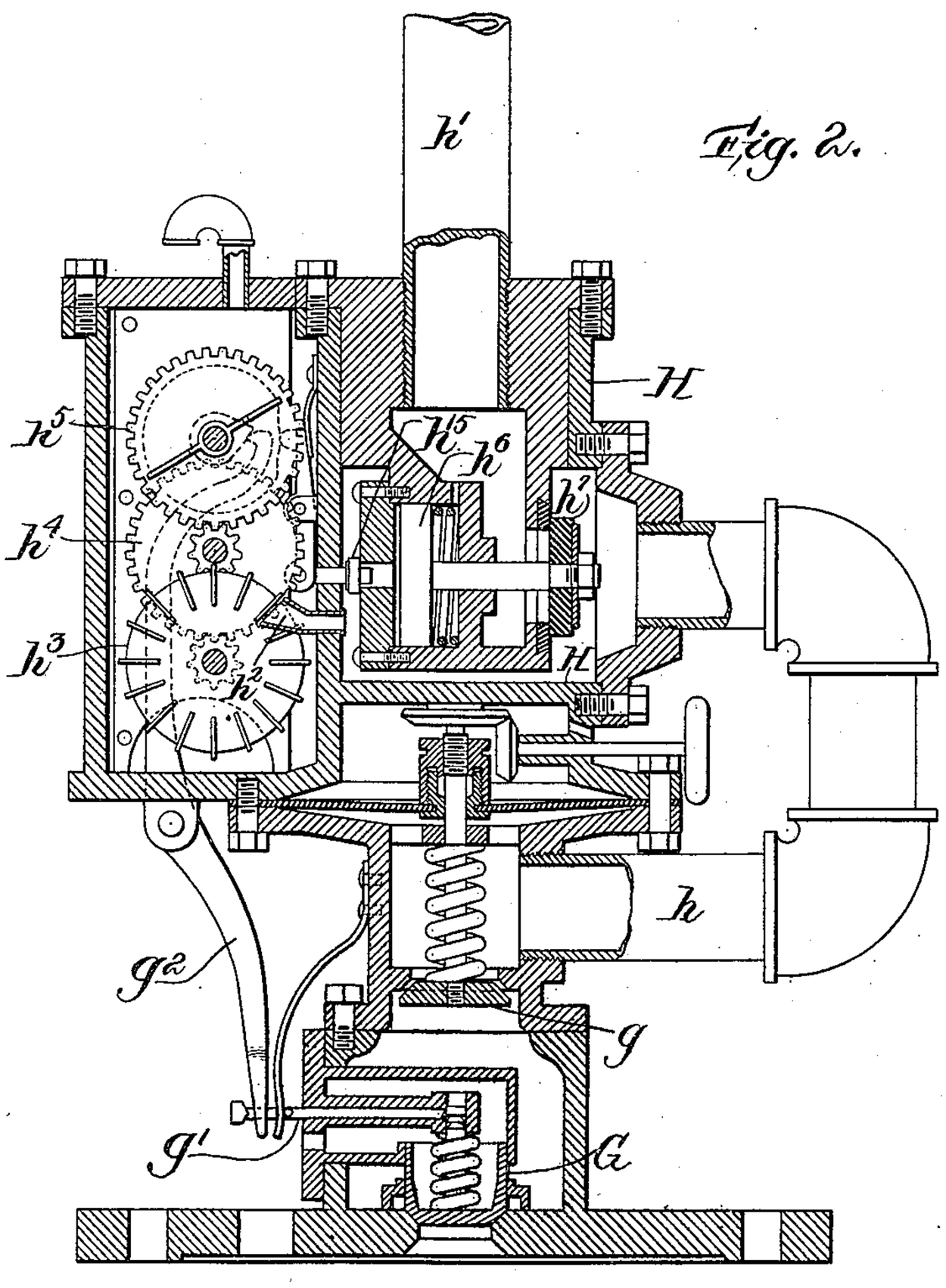
Fig. 2.



Witnesses:
Arthur F. Mundell
Carsten B. Maynadier

Inventor:
William S. Bryant

UNITED STATES PATENT OFFICE.

WILLIAM S. BRYANT, OF COHASSET, MASSACHUSETTS.

SELF-ANNOUNCING BUOY.

SPECIFICATION forming part of Letters Patent No. 666,259, dated January 22, 1901.

Application filed June 8, 1900. Serial No. 19,549. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. BRYANT, of Cohasset, in the county of Norfolk and State of Massachusetts, have invented a new and useful Self-Announcing Buoy, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation, partly in section, of one of my buoys. Fig. 2 is a vertical section showing the sound-producing apparatus in its preferred form.

The main feature of my invention is a buoy provided with a chamber containing air or other fluid under pressure and a motor actuated by that fluid and controlling the supply of that fluid to a whistle or the like, so that so long as there is sufficient pressure in the fluid-chamber the buoy will emit characteristic sounds, and thereby not only give warning of its presence, but also of its locality.

Another feature of my invention is the combination of such a sound-producing apparatus with a buoy which automatically supplies air under pressure to the fluid-pressure chamber, the purpose of this second feature of my invention being to make my self-announcing buoy automatic.

In the drawings, A is a buoy with a tube B open at the bottom and of such a length that when the buoy is lifted by a wave there will be a partial vacuum above the level of the water in tube B and air will flow in through pipes b and valves b'. Then when the buoy falls water will rise in tube B and force air and water through valve D into reservoir F, thereby compressing air in reservoir F. When the water-level in reservoir F is high enough, float d will open escape-valve d' and part of the water in reservoir F will escape through valve d', and thus the level of the water in F can never be too high. All this is fully described in my Patent No. 643,863, dated February 20, 1900, and one feature of my present invention consists in enlarging the reservoir F by connecting it, as by pipe f, with the interior of the buoy A, for in stormy weather the maximum pressure is soon reached in F, which is necessarily comparatively small, and the automatic air-compressing action of the buoy then ceases, while if the body of the buoy be used as an additional reservoir of compressed air the automatic air-compressing action of the buoy will continue very much longer and air will be compressed for use during calms; but this feature of my invention is not simply making F larger than in my patent above referred to, for obviously were not the escape of air from F regulated the compressed air would simply escape the faster the more it was compressed, and in order to embody this feature of my invention it is necessary not only to connect initial compression-reservoir F with storage-reservoir A, but also to apply a regulating-valve to regulate the escape of air from both F and A, and it is this combination, fully described below, which constitutes this feature of my invention.

The pressure-regulating valves G and g are secured on reservoir F and act to keep the fluid-pressure above valve g at the desired point so long as the pressure in F is sufficient. These pressure-regulating valves G and g are well known and need no explanation. Supply-pipe h connects the chamber above valve g with the interior of casing H of the sound-producing apparatus, and the compressed fluid in casing H supplies the motor and the whistle connected with pipe h' as follows: Air flowing through pipe h^2 actuates vane-wheel h^3 and a gear on shaft of h^3 actuates gear h^4, which in turn actuates gear h^5, whose shaft carries a cam (shown in dotted lines in Fig. 2) which controls the small valve h^{15}. When this small valve h^{15} is opened by the motor, the piston h^6 opens whistle-valve h^7, and the whistle sounds so long as small valve h^{15} is held open by the cam of the motor; but when valve h^{15} is not under control of the motor whistle-valve h^7 is closed.

The operation is as follows: As the buoy A rises and falls on the waves air is compressed in reservoir F and in buoy A, and the more violent the motion of the buoy the greater the quantity and pressure of the compressed air. When the pressure in reservoir F exceeds the pressure required for working the motor and sounding the whistle—that is, exceeds the pressure required above valve g and in casing H—air is supplied by the regulating-valve G, so that the pressure is kept nearly constant in casing H no matter how high it may be in F. Therefore the speed of vane-wheel h^3 and the other parts of the mo-

tor is nearly constant, and if there be only one depression in the cam controlling small valve h^{15} the whistle will make one long sound for every revolution of that cam, and by making two depressions two sounds will be emitted for each revolution, and so on. Also by varying the surface speed of the cam the length of the sounds can be varied, as will be clear. In this way each buoy can be caused to give its characteristic sound, and if this the first feature of my invention be combined with my automatic air-compressing buoy the supply of compressed air will be automatic, and if the buoy itself be used as a storage-reservoir the buoy will emit its characteristic sound not only in stormy weather, but also during calms, until all the surplus air stored is exhausted.

As it is of much importance that the motor shall always complete its cycle and thereby always cause the buoy to emit its characteristic signal, I make valve G as a pop-valve and so adjust its spring that air will not escape past valve G until the pressure in reservoir F is well in excess of the pressure desired in casing H, so that when valve G is lifted by the pressure in reservoir F the escape of compressed fluid will be ample to quickly raise the pressure in casing H to the desired amount and maintain that pressure in casing H to the desired amount; but practically it is also necessary to provide means by which the motor shall prevent valve G from seating until the motor has completed its cycle, and for this purpose I apply a detent g', which acts to hold valve G off its seat after it rises until the motor has nearly completed its cycle, when lever g^2, actuated by the motor, withdraws detent g' and allows valve G to seat if the pressure in reservoir F has fallen too low to furnish a new supply of fluid under pressure to complete another cycle. This combination of a main reservoir, a working reservoir, a regulating-valve, a detent to keep the regulating-valve open, a motor, and means by which the motor releases the detent at each revolution is also an important feature of my invention, as it prevents the partial operation of the motor when the supply of fluid under pressure is falling and also prevents waste of fluid under pressure from reservoir F when the pressure in reservoir F has fallen too low to properly operate the motor and give the characteristic signal of the buoy. Suppose, for example, that a pressure of about twenty pounds be desired in casing H for giving a very powerful and characteristic set of blasts. Then valve G may be set to rise only when the pressure in F is, say, thirty pounds; but after valve G pops—that is, opens suddenly and widely—the pressure in casing H will at once rise to twenty pounds and be maintained at twenty pounds so long as valve G does not close, and valve G is prevented from closing until detent g' is withdrawn by the operation of the motor; but when detent g' is withdrawn by the operation of the motor valve G will close if the pressure in reservoir F has fallen below or nearly to twenty pounds, and valve G will remain closed until the pressure in reservoir F has been restored to thirty pounds. These figures are for example only, of course, as they vary necessarily with the character of the sound-producing apparatus.

What I claim as my invention is—

1. In combination a buoy; a reservoir of compressed fluid; a regulating-valve for supplying compressed fluid under constant pressure; a motor actuated by the compressed fluid after it passes from the reservoir through the regulating-valve; a sound-producing device; and mechanism actuated by the motor and regulating the supply of air to the sound-producing device.

2. In combination a buoy; a reservoir of compressed fluid; a regulating-valve for supplying compressed fluid under constant pressure; a motor actuated by the compressed fluid after it passes from the reservoir through the regulating-valve; a detent to hold the regulating-valve open; and mechanism actuated by the motor to withdraw that detent when the motor is about completing its cycle.

3. In combination a buoy; a long tube projecting from it open at its lower end; a reservoir at the upper end of that tube; an air-inlet valve opening into that tube; an outlet-valve at the upper end of that tube opening into the reservoir; a drain-valve and its float in the reservoir; a regulating-valve opening out of the reservoir; an air-motor; and a sounding device operated by compressed air, and controlled by the motor.

4. In combination, a buoy; a long tube projecting from it open at its lower end; a reservoir at the upper end of that tube; a check-valve governing the passage between the tube and the reservoir; a pipe forming a conduit to admit free passage of air in both directions between the reservoir and the interior of the buoy; and a regulating-valve regulating the outflow of air from the reservoir.

WILLIAM S. BRYANT.

Witnesses:
ARTHUR F. RANDALL,
GEORGE A. ROCKWELL.